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# Social indicator approaches to assessing and monitoring forest community sustainability

*T.M. Beckley and T.M. Burkosky*

Northern Forestry Centre
Information Report NOR-X-360

Natural Resources Canada
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*T.M. Beckley and T.M. Burkosky*

INFORMATION REPORT NOR-X-360

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## ABSTRACT

Several national and international initiatives have encouraged the development of criteria and indicators to measure progress in sustainable development and sustainable forest management. This review is intended to introduce the forestry community to social indicators that have been used to document and monitor community sustainability and community well-being. Natural resource sociologists have been studying community stability for over half a century. Included is a discussion regarding selection criteria for social indicators that focuses on the advantages and disadvantages of qualitative and quantitative indicators. A review of several ongoing projects is included, and the appendix provides a quick reference for twenty-two indicator initiatives.

## RÉSUMÉ

Plusieurs initiatives nationales et internationales ont favorisé l'élaboration de critères et d'indicateurs en vue de mesurer les progrès accomplis en matière de développement durable et d'aménagement durable des forêts. Ce compte rendu vise à faire connaître au milieu forestier les indicateurs sociaux qui ont servi à documenter et à surveiller la durabilité et le bien-être des collectivités. Des sociologues des ressources naturelles ont étudié la stabilité de collectivités durant plus d'un demi-siècle. On trouvera ici un exposé concernant les critères de sélection des indicateurs sociaux qui met l'accent sur les avantages et les inconvénients des indicateurs quantitatifs et qualitatifs. Un examen de plusieurs projets en cours est aussi inclus, et l'annexe fournit un bref renvoi à vingt-deux initiatives liées aux indicateurs.

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**NOTE**

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# INTRODUCTION

For several decades, there have been ongoing efforts to define and monitor the health and well-being of societies, economies, communities, and biophysical environments. The Brundtland commission popularized the concept of sustainable development in 1987, and in the wake of its report *Our Common Future* there have been many efforts to assess social, economic, and ecological health and well-being, using the language of sustainability (World Commission on Environment and Development 1987).

Social and political pressure on various groups to deliver hard evidence of progress toward sustainability is forcing them to define and monitor measures of sustainability. Some of these efforts focus on different scales of sociopolitical jurisdictions, such as communities, provinces, and nations. Others focus on different ecological scales, such as watersheds, forests, and ecosystems.

The failure to define and monitor sustainability, through establishing benchmarks and subsequently tracking trends, will relegate the concept of sustainability to buzz word status. Some already feel that the term is vacuous, and will never contribute to meaningful analyses. Many people describe sustainable development as a path as opposed to a destination. Nevertheless, we still need concrete measures for sustainability indicators so that we know if we are moving in the right direction along that path. This paper is an effort to review indicators that have been or are being used to measure community sustainability. The ultimate aim is to help clarify the concept and thereby increase our chances of choosing policies and practices that enhance community sustainability.

Sustainability monitoring of social and economic variables often takes place at the community or municipal level, though household, regional, and national initiatives exist. The Canadian Council of Forest Ministers has initiated the Criteria and Indicators Initiative (C&I) to monitor the environmental, social, and economic aspects of forest management in Canada. One of the social themes included is "Sustainability of Forest Communities." Indicators under this theme are intended to monitor variables relevant to the sustainability of human communities that depend on their surrounding forest resources (Canadian Council of Forest Ministers 1995). Such attempts to measure the sustainability of human forest communities are rare, but there is growing interest.

Other national and international initiatives are relevant. The Montreal Process for reporting sustainability indicators at an international level incorporates community-oriented social indicators. Forest certification processes that also entail social indicators of community health and well-being have been proposed by environmental non-governmental organizations such as the Forest Stewardship Council (Forest Stewardship Council 1994), or by governments and industry, such as the Canadian Standards Association (Canadian Standards Association 1996). Recently, model forests in Canada have been charged with defining and monitoring indicators that are appropriate and relevant to their specific locales.

Many of those who are developing these protocols for forest community sustainability monitoring have forestry or physical science backgrounds. This paper is intended to provide these decision makers with some background knowledge of current and historical attempts to develop indicators for measuring community sustainability.[1] It should also benefit academics working in this area, as resources related to community sustainability monitoring are widely scattered in booklets, internet sites, articles, newsletters, and the like.

This review is not meant to be comprehensive. Instead, it is intended to direct readers to some of the most recent and current initiatives. Despite the focus on contemporary efforts, some reference is made to the reasonably long history of social indicator research that takes the community as the unit of analysis.

We begin by discussing dynamic tensions between qualitative, subjective indicator approaches and quantitative, objective indicator approaches. We then review the literature on community stability, a closely related precursor to today's concern with community sustainability. This is followed by a review of contemporary initiatives that attempt to

[1] It is important to note that there are significant areas of social indicators for forest sustainability that this review will not address, such as public involvement in decision making and Aboriginal rights and opportunities.

define measures of community sustainability. Because so few examples exist that are specific to forest-dependent communities, other community indicator monitoring initiatives, as well as quality-of-life research (a predecessor of the social aspect of sustainability reporting), are discussed later in the paper. We conclude the text with some recommendations for future research, and with some issues that need further attention. Finally, an appendix is included that lists the indicators from 22 studies that we have reviewed. The appendix will help the reader make a quick assessment of indicators that are widely used or agreed upon (*see* inside back pocket of report).

## DYNAMIC TENSIONS INVOLVED IN DEFINING AND USING INDICATORS OF COMMUNITY SUSTAINABILITY

Selecting indicators of community sustainability involves a number of normative issues. Any given indicator list reflects the needs and interests of the group that chose them. Specific to our concerns with forest-dependent communities, some groups may have a significant interest in demonstrating that *status quo* forestry practices and procedures result in sustainable communities. Other groups or individuals may feel that current forestry practices do not result in sustainable communities.

Persons with these different perspectives may agree on some indicators, such as unemployment or poverty, for example, but differ on what they consider acceptable thresholds. In other cases, defenders of the *status quo* and proponents of reform may propose quite different sets of indicators. It is important to acknowledge these underlying political dimensions when considering any given list of indicators.

The purpose behind generating lists of indicators may also influence the scope and nature of those reporting frameworks. A community interested in developing its local natural, human, and institutional resources may come up with a very different list from a government department that is interested in tracking sustainability over time for the purpose of periodic reporting to provincial, national or international constituencies. Again, consideration of the audience is important. Communities may only be interested in answering questions for themselves and developing appropriate community development programs based on results of such introspection. Government departments are likely to be concerned with provincial, national, and international image.

Therefore, locally generated indicators may include such things as empowerment, the depth and breadth of community networks, access to decision-making, etc. (Bauen et al. 1996).

Public-service-generated indicator lists may focus more on aspects of communities that are easier to quantify, generalize, and compare across jurisdictions. Examples of these indicators might be poverty or unemployment, as mentioned above; or education attainment, suicide, divorce, and other measures of social dislocation; or per capita expenditures on education, health, or other social services.

A related source of dynamic tension in the selection of community sustainability indicators has to do with the objectivity or subjectivity of indicators. Subjective measures often entail some form of community self-assessment, either by key informants, or through community surveys. Objective measures are drawn primarily from secondary data sets that document social structural variables, rather than psychological states.

Kusel (1996) provides a detailed discussion of the limitations of each approach. Among the disadvantages of objective, sociodemographic measures are the potential of aggregate data to mask important distribution issues within families, communities, or regions, and the fact that secondary indicators of wealth or income do not address how effectively individuals utilize these resources to increase their quality of life.

A major disadvantage of using subjective indicators is that there is no standard measure of happiness or fulfillment, so that results from individual respondents may not be comparable. Individuals may lower or raise their expectations based on what they believe they may realistically achieve (Kusel 1996). Beckley (1995) also discusses

limitations of traditional, objective approaches of community sustainability in a forestry context.

A few examples will better illustrate the difficulties associated with each of these general types of indicators. Hart (1995) provides a definition of a sustainable community as a group that:

> "seeks to maintain and improve the economic, environmental, and social characteristics of an area so its members can continue to lead healthy, productive, enjoyable lives there . . . the primary goal of a sustainable local community is to meet its basic resource needs in ways that can be continued in the future".

Social sustainability, according to the British Columbia Round Table on the Environment and the Economy (BCRTEE) 1993, is achieved when all members of the community are practicing responsible citizenship and can

- achieve and maintain personal health: physical, mental, and psychological;
- feed themselves adequately;
- provide adequate and appropriate shelter for themselves;
- have opportunities for gainful and meaningful employment;
- improve their knowledge and understanding of the world around them;
- find opportunities to express creativity and enjoy recreation in ways that satisfy spiritual and psychological needs;
- express a sense of identity through heritage, art, and culture;
- enjoy a sense of belonging;
- be assured of mutual social support from their community;
- enjoy freedom from discrimination and, for those who are physically challenged, move about a barrier-free community;
- enjoy freedom from fear, and security of person; and
- participate actively in civic affairs.

The barriers to selecting indicators based on these definitions are significant. Most of these are subjective, and many would require extensive psychological testing in fairly large samples to create baseline data. There are likely to be major methodological issues in defining such things as a sense of belonging, or mutual support from their community. Even if appropriate measures for such concepts can be constructed, the issue remains—are these thresholds or benchmarks? Assuming one could develop effective measures for freedom from fear, or a sense of identity, how much of such desired ends are enough to ensure sustainability? And who will make those determinations?

Conversely, objective measures such as poverty, unemployment, education attainment, and the like, may have little relation to individual or aggregate (community level) assessments of well-being. Communities with high levels of negative indicators may come to accept such conditions as normal (Duncan and Lamborghini 1994; Gaventa 1980), while communities with low levels of negative indicators may feel they have room for improvement. There remains a poor correlation between objective indicators and self-assessments of individual or community health and well-being.

The debate over the utility of subjective versus objective indicators will continue. Objective indicators are widely used, however, in both general social evaluation contexts, and in more directed and specific social impact assessment research (Burdge 1994). Anyone using an indicator approach to community sustainability must balance the issues of audience, data availability, validity, reliability, and comparability as they relate to subjective and objective indicators. When in doubt, the best approach is likely to include both objective and subjective indicators, recognizing that subjective indicators may perform better with respect to certain selection criterion (such as validity), and objective indicators may perform better with respect to others (such as reliability).

## FROM STABILITY TO SUSTAINABILITY IN FOREST-DEPENDENT COMMUNITIES

There is a long tradition of studying well-being in forest-dependent communities, usually in the context of community stability (Kusel 1996). Community stability has historically been closely linked to a steady flow of timber products to ensure stable employment in the timber industry.

Policy makers assumed that steady flows of timber would lead to stable levels of employment, which in turn, would lead to community stability. These turned out to be spurious assumptions. LeMaster and Beuter (1989) and Richardson (1996) provide extensive background and citations on the community stability debate. We wish to highlight just a few early approaches that either embodied or implied an indicator approach to community stability. Following these, we will move on to a discussion of contemporary efforts to define community sustainability in forest-dependent places.

Kaufman and Kaufman (1946) undertook one of the first studies that examined the relationship between natural resource use and community well-being, in 1946 in the forest communities of Libby and Troy in Montana. The Kaufmans defined a stable community as "one in which there was orderly change toward given goals; those goals embracing 'the good life' in whatever way that may be defined".

Even in this early work, the Kaufmans discussed dimensions of stability that were amenable to an indicator or monitoring approach. They wrote that forest community decline was characterized by "... an exhausted resource, ... unemployment, ... declining population, ... and empty and decaying buildings." (Kaufman and Kaufman 1946). The Kaufmans proposed 10 strategic areas of physical, economic, and social life that promote forest community stability:

1. Developing a stable timber industry with the greatest possible remanufacturing.
2. Practicing sustained yield forestry and wise use of other natural resources on timber lands.
3. Promoting greater public participation in determining forest policy.
4. Creating a more diversified and balanced economy.
5. Securing adequate leadership in community affairs.
6. Providing greater assistance to youth, especially with reference to vocational guidance and training in citizenship.
7. Strengthening the rural home.
8. Creating a more community-centered religious emphasis.
9. Developing a forest-centered tradition.
10. Organizing for united action of the greater Libby–Troy community.

(Kaufman and Kaufman 1946)

Many indicators that scholars consider relevant today are derived from these 50-year-old stability indicators.

The Kaufmans' approach centered on identifying factors in community life that lead to stability. Marchak (1983), in a study of forest-dependent towns in British Columbia, attacks the same problem from a different angle. She focuses on causes of community instability. The most prominent source of instability, according to Marchak, is the uncertainty of employment in the forest industry. Both loggers and sawmill workers experience frequent layoffs, leading to high turnover rates and transience. Sawmill workers can be quickly trained, so the loss of experienced workers is not particularly problematic for employers. Loggers tend to be more skilled, but are also readily available, so there is little need for companies to invest in the labor force or its stability (Marchak 1990). Transience brought about by unstable labor markets, in turn, leads to community instability, as forest sector workers move from place to place in search of more permanent employment.

Another reason for community instability in many British Columbia forest communities is geographical isolation and the lack of employment for women. Marchak (1990) says:

"Women co-resident with loggers, in particular, are likely to live in trailers with their children while their husbands are at logging camps. Few can find work in these resource-extractive towns; very few employers in resource industries employ women in production lines or logging camps. These women have no social network of kinfolk as they would in a rural community. . . . Women are profoundly isolated . . ."

A third source of instability, according to Marchak, is the uncertainty parents feel toward their children's future in what they know is an impermanent, unstable community. Because of such concerns, many residents work to buy themselves out of the community. If they cannot, they know that their children may be destined to repeat their own patterns of transience (Marchak 1990).

More recently, Kusel (1996) has expanded the concept of well-being in forest-dependent communities to include the concept of community capacity. Community capacity is "the collective ability of residents to respond (the communal response) to external and internal stresses; to create and take advantage of opportunities; and to meet the needs of residents, diversely defined."

Kusel (1996) combines subjective assessments with objective measures to determine community capacity. Elements that require consideration in the evaluation of community capacity include:

- physical capital, or the physical elements and resources in a community and financial capital;
- human capital, or the skills, education, experiences, and general abilities of the residents; and
- social capital, or the ability and willingness of residents to work together for community goals.

Some of these elements rely on objective measures, others on subjective assessments. The resulting aggregate measure of community capacity is not intended to measure the well-being of individuals, but that of the community as a whole and the potential for creating additional opportunities and improving well-being (Kusel 1996). Assessing community capacity this way represents a promising step toward multidimensional sustainability monitoring, one that avoids the pitfalls associated with committing to exclusively objective or subjective approaches.

The process Kusel outlines for measuring community capacity is complex. Researchers conduct workshops with local experts who are knowledgeable about diverse community issues. The experts assess the three components and identify those that have the greatest impact on overall community capacity (Kusel 1996). The selection of the experts is a critical aspect of an assessment. The individuals chosen must be knowledgeable about local issues, resources and institutions without being "community boosters or overly partisan about issues" (Kusel 1996).

Beckley and Murray (1997) are currently conducting a multi-year research project on forest community sustainability across Canada. This research is similar to Kusel's work in its attempt to combine subjective and objective assessments of variables thought to be related to community sustainability. Objective indicators under investigation include the incidence of low income, the unemployment rate, demographic stability, education attainment, proportion of local income from social assistance, and real estate values. Some of these variables will be compared in a national database of timber-dependent communities.[2] All the listed indicators will be examined in detail in eight case studies.

The case studies will also entail qualitative interviews of residents on their perceptions of poverty, unemployment, education, etc. Furthermore, the case studies will use subjective assessment of residents to examine opportunity structures for men, women, seniors, youth, and racial minorities.

The attempt to understand the chosen indicators through qualitative methods will address, in part, the shortcomings of objective indicators. Paying close attention to sub-groups within the population of any given community will help address distribution issues that may be masked when using only aggregate, secondary data. These concerns are reflected in the title of the project, *Sustainability for Whom? Social Indicators for Forest-dependent Communities in Canada*.

[2] Timber-dependent communities are the subset of forest-dependent communities that rely upon the industrial forest sector (harvesting and processing) for a significant portion of their economic base.

Another explicit attempt to define and measure community sustainability indicators in a forestry context is work by the Institute for Research on Environment and Economy under the direction of Dr. Phillipe Crabbé, titled *Developing Indicators of Community Sustainability in Relation to Forestry*. This research is similar to Kusel's effort in that the researchers include the concepts of physical, human, and social capital, along with natural capital, and community capacity. Also similar to Kusel, they attempt to strike a balance between objective and subjective approaches to defining community sustainability.

According to Crabbé et al. (1995), there are three stages in determining community sustainability. The first is establishing community goals and defining community conceptions of sustainability through interviews with stakeholders, analysis of local council meetings, news reports, and public debate. This is an important step because of the various meanings different communities may give sustainability:

> "In a rural community, the main objective might be generation of income, stable local employment opportunities, meaningful work for all or a forest environment that can provide a sustained yield of all resources, while a First Nations community might emphasize sustenance of long term hunting, trapping and fishing levels as a prime objective" (Crabbé 1996).

The second step, an assessment of where a community stands relative to where it wants to be, involves a number of factors, including examining sources of instability. The third step involves assessing resiliency and the adaptive capacity of a community to change. Ideally, the community sustainability indicators chosen provide information in both of these areas.

Crabbé et al. developed 11 categories of indicators: construction of the community, recruitment of citizens, organization of work and occupation, material and wealth stratification, interpersonal relationships and associations, recreation activities, goods and services, healing, school and training programs, cultural/spiritual [activities], and social conflict and control. These indicators were then grouped under the four factors of production: human capital, physical capital, natural capital, and social capital. This framework was then applied to two forestry-dependent communities.

The Willapa Alliance has put together a document that reports a wide range of indicators relevant to one rural community in Washington State. Their report *Willapa Indicators for a Sustainable Community*, is an impressive collection of secondary data related to the productivity, diversity, and resilience of their community. The indicators chosen by the Willapa Alliance WISC Committee cover environmental, economic, and community topics. The effort of this group is also a significant demonstration of community capacity to address community sustainability from a local perspective (Schoonmaker and von Hagen 1995). Other communities interested in taking an indicator approach to identifying issues of prime concern in achieving sustainability should consult this document as a possible model. The report also includes an appendix of additional potential indicators for community sustainability monitoring.

The Sustainable Communities Initiative (University of Victoria) has developed an ambitious framework for what it terms State of Sustainability (SOS) reporting. The framework attempts to treat biological, social, and economic indicators in an integrated fashion. Walter calls this the Ethics-Conservation-Competition Framework (ECCF). According to Walter (1994), "these aspects or dimensions are fundamental because they govern the central relationships of community: of humans to each other, of humans to non-human populations (plant and animal), and of humans to their ecosystem, including the natural resource base." Each dimension is measured using four classes of indicators: resources, capacities, processes, and interventions. The framework is intended to provide

> "... a classification of indicators that allows various parts of the sustainability system to be examined in a multi-dimensional way. A particular indicator may appear in various places in the system, and in each case would have a different interpretation according to the aspect of the system being examined." (Walter 1996a)

A modified version of the ECCF has been applied to a pilot study of British Columbia's Southern Interior Ecoprovince. While the study is not specifically related to communities, this region contains many forest-dependent communities. The major dimensions of indicators used were Conserving Basic Resources, Living in the Ecosystem, and Socioeconomic Sustainability (which involved

competition, cooperation, and adaptation) (Walter 1996a).

The Sustainable Communities Initiative will also be using this framework to conduct a Forestry-Based Community Sustainability Audit Project (CSAP). This project will be implemented in three forestry-based communities. It is designed to lay the foundation for understanding the threats and opportunities influencing the sustainability of communities and to develop a method for identifying these in practice, and provide periodic audits to support assessments of policy and policy revision (Walter 1996b).

Attempts to develop indicators for community sustainability are not limited to North America. A project initiated by the Centre for International Forestry Research (CIFOR) focuses on socioeconomic sustainability in a general sense, not necessarily specific to communities. The CIFOR project considers social sustainability to be comprised of three distinct social elements: 1) the maintenance of people's well-being with a focus on forest dwellers, 2) the actions of people that affect the sustainability of the forest, and 3) the intergenerational distribution of benefits (Wollenberg and Colfer 1996).

Although the CIFOR project is meant to assess sustainable forest management more generally, it does include a number of indicators of the well-being of forest dwellers, as well as indicators for the other two social elements. Wollenberg and Colfer (1996) discuss the following measures of well-being of those living in forest areas:

- security and sufficiency of access to resources, now and in the future;
- economic opportunity;
- decision-making opportunity;
- justice, fair resolution of conflict and distribution of benefits, rights, responsibilities, and incentives;
- heritage and identity; and
- safety and health.

## OTHER SUSTAINABILITY MONITORING EXAMPLES

Although sustainability monitoring for forest communities is limited, there is currently a great deal of work being done to address the sustainability of cities, regions, provinces, and even countries. The following examples represent just a few of the projects underway to assess the sustainability of cities and regions.

In 1994, the British Columbia Round Table on the Environment and the Economy produced a report based on their effort to monitor urban sustainability in the province using five cities (the Greater Vancouver Regional District, Greater Victoria, Prince George, Kelowna, and Cranbrook) which were chosen to represent the broad regions, and the variety of environmental, economic, and social conditions in British Columbia (BCRTEE 1994). Indicators were chosen to represent five major urban themes: human settlements and population growth, the urban environment, the urban economy, social well-being, and governance and responsible citizenship (BCRTEE 1994).

The criteria used in the selection of indicators included: comprehensiveness; data availability; understandability and accessibility; sensitivity to changes over time; capability for use at different levels of aggregation; validity; and reliability (BCRTEE 1994).

A group called Sustainable Seattle has also initiated a sustainability monitoring process for Seattle, Washington. Forty indicators were chosen. Each indicator was:

- reflective of something basic and fundamental to long-term economic, social, or environmental health of a community over generations;
- accepted by the community;
- attractive to local media;
- statistically measurable; and
- logically or scientifically defensible.

Their categories for indicators in the 1995 report are environment, population and resources,

economy, youth and education, and health and community (Sustainable Seattle 1995).

In the publication *Ontario beyond tomorrow: ideas for building a sustainable society*, the Premier's Council and the Ontario Round Table on Environment and Economy (1995) stress the importance of choosing a small number of key indicators for assessing the province's progress towards sustainability. The six core indicators they chose to report on as examples were:

- unemployment rate,
- state of children (child poverty),
- adult literacy,
- family income and income equality
- crime rate, and
- air quality.

Hodge's (1995) framework for assessing sustainability is made up of four interrelated strategic elements: ecosystem, interaction, people, and synthesis. The people element was designed to assess the well-being of people at the individual, family, community, and institutional levels. Hodge has applied aspects of this framework to the Great Lakes Basin, and the National Round Table on the Environment and Economy (NRTEE) has used it to develop a list of rudimentary sustainability indicators for Canada.

The United Nations Department for Policy Coordination and Sustainable Development (DPCSD) is currently developing a list of national sustainable development indicators to be completed by the year 2000. So far, they have generated 130 indicators based on a driving force-state-response framework. The driving force indicators represent human activity; state indicators represent the condition of sustainable development, and response indicators review policy options and other responses to change. Sub-categories of indicators in the DPCSD framework include social, economic, environmental, and institutional (United Nations Department for Policy Coordination and Sustainable Development 1997).

## HEALTHY COMMUNITIES

The healthy communities movement is closely related to, but predates, efforts to monitor and measure community sustainability. Many of the goals and indicators are similar, so it is easy to make the case that they are part of the same research stream. Patterson describes the healthy communities movement as an attempt to integrate indicator research on quality of life with policy concerns related to sustainable development. His conception of the synthesis is a framework that addresses both the well-being of community residents and the health of the surrounding physical environment (Patterson 1995).

Hancock and Duhl define a healthy city as

> ". . . one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to support each other in performing all the functions of life and in developing themselves to their maximum potential" (Lane 1989).

Based on this definition, the Canadian Healthy Communities Project was promoted from 1988 to 1991. Although funding no longer exists (the project was designed for completion in 1992), more than 200 Canadian communities continue to promote the concept (Lane 1989; National Round Table Review 1994).

A number of healthy community project participants use indicators in order to evaluate their progress towards becoming a healthy city. The goal in developing and implementing these measures of community health is to illustrate how factors such as socioeconomic status, education, social support, and clean and safe physical environments effect individual and community health. The importance of the healthy communities movement for sustainability monitoring has been the community-level and local efforts to recognize the linkages between human behavior and ecosystem and human system well-being (Burch 1994).

Sustainability monitoring has borrowed from past research on quality of life for some of its theoretical and methodological background. Quality-of-life studies emerged with the social indicators movement of the late 1960s, largely in response to dissatisfaction with traditional economic methods of measuring well-being. They recognized that economic progress is often accompanied by degradation of natural resources, increased poverty and other social problems among some population segments (Schatan 1990).

Although this line of scholarly inquiry spans 30 years, the literature has not developed in a linear fashion, with recent findings being built upon early advances in understanding the subject. Rather, the quality-of-life literature is often cryptic and fraught with different opinions on what constitutes quality of life or well-being, and disagreement on how to measure these concepts.[3]

Despite the mixed legacy of the quality-of-life literature, it has provided important models for the measurement of the human and social dimensions of sustainability. Anyone considering taking an indicator approach to measuring community sustainability should familiarize themselves with some of this literature.

There are three general types of quality-of-life studies:

1. Those done on a national or cross-national level to measure and compare the social progress (or development) of nations;
2. Those that focus on the quality of life in local communities; and
3. Those that focus on the more subjective, individual aspects of well-being.

Although they stem from the same intellectual background, social development approaches tend to take an international development aid perspective, while community approaches focus on comparing quality of life across communities (Holtz 1995). Subjective quality-of-life research has been more rare and is often undertaken in the context of health and illness.

Quality-of-life research has been used for a number of purposes including descriptive reporting of the state of society; analytic studies of social change; forecasting the future; evaluating social programs; setting goals and priorities; and developing a system of social accounts (Eyles 1994).

Most quality-of-life studies take an objective, sectoral approach to defining and measuring well-being. According to Hay and Rutman (1993):

> "Sectoral approaches to well-being take defined sectors of well-being (such as health, education, housing, employment, etc.), outline measures and indicators for each sector (mortality rates, number of students completing high school, housing starts, unemployment rates etc.), and then examine levels of achievement on the measures and indicators for each sector."

An example of such an approach is The United Nations Development Project's (UNDP) human development index (HDI). Since 1990, the UNDP has been reporting on the development and progress of the world's nations by combining indicators of life expectancy, educational attainment, and income. They conceive of human development as a process of widening all people's choices and level of well-being. Hence, one of the key features of the index is the use of disaggregation to highlight disparities and gaps among regions, urban and rural areas, and between sexes and ethnic groups.

The Human Development Reports also measure gender inequality using the Gender-related Development Index, which measures women's achievement in the same areas as the HDI, and the Gender Empowerment Measure, which examines progress in advancing women politically and economically (United Nations Development Programme 1997).

Estes' (1988) influential framework for measuring national and international social development also takes a sectoral approach to measuring quality

[3] The terms quality of life, well-being, and social indicators are often used interchangeably.

of life. The Index of Social Progress examines the domains of education, status of women, demography, political participation, cultural diversity, and welfare effort.

The Ministry of State for Urban Affairs conducted one of the earliest urban quality-of-life studies in Canada, in 1975. The objective of the work was to explicitly compare certain aspects of the quality of life across several Canadian cities. Furthermore, the hope was to discuss, develop, and implement indicators for identifying urban problems (Shulman and Bond 1978). Ultimately, 36 indicators in three categories (social development, economic development, and physical development) were selected based on five criteria: comprehensiveness, availability of data, reliability and accuracy, validity, and topicality (Shulman and Bond 1978).

The dynamics involved in defining and using quality-of-life indicators have been much the same as those involved with indicators of community sustainability. The primary concern has been the traditional, almost exclusive reliance on objective indicators. Recent debate on this issue has lead to a growing recognition that quality-of-life research should work to incorporate both objective and subjective indicators (Beesley and Russwurm 1989).

## DISCUSSION

One fact should be clear from this review: there is great diversity in approaches to defining and measuring the concept of community sustainability. The dynamic tensions outlined at the beginning of this paper—between objective and subjective approaches, and between community-based versus academic and government sponsored initiatives—are partly responsible for this diversity.

In the most recent work, scholars, government policy-makers, and communities are trying to overcome these tensions by taking an inclusive approach. Kusel (1996), Beckley and Murray (1997), Crabbe et al. (1996) all advocate combining subjective and objective approaches. The work of the Willapa Alliance WISC Committee is an interesting case of a community advocating an objective approach. Some other community-oriented initiatives, such as Bauen et al. (1996) and Hart (1995), focus on subjective measures, or non-traditional objective measures that may be less well supported by existing data sources.

The appendix to this review includes the actual indicators put forward by some 22 different initiatives. These studies range from community-based initiatives to ones sponsored by the United Nations. Efforts by governments, academics, independent researchers, and non-government organizations (NGOs) are also included. The appendix includes more than a hundred different social indicators. Often, different language is used to convey similar concepts. Some indicators are widely agreed upon. Unemployment and poverty measures are referred to by more than two-thirds of the reports and studies. Other indicators are unique to single studies. Most of the indicators included are objective measures, though some, such as exposure to arts, or reliance on local resources, are either subjective or very difficult to measure in quantitative terms.

Many of the initiatives reviewed discuss selection criteria for indicators. In taking an indicator approach to community sustainability reporting, a number of factors must be weighed against one another. These include data availability, cost, reliability, validity, and resonance with the intended audience (especially study communities themselves). The goals, interests, and ideological leanings of authors do influence the types of indicators that they put forward. These are not value-free, non-political exercises, so any indicator list should be scrutinized for ideological biases. On the other hand, indicators that are advocated by a wide range of interest groups, including industry, environmental or community NGOs, government agencies, and academics are probably good indicators. Such indicators will have greater legitimacy with both expert and lay readers, and if they are used in many case studies, they may provide a more solid basis for future comparisons across communities.

## CONCLUSION

Governments, academics, NGOs, natural-resource-based industries, and most importantly, local communities themselves are increasingly recognizing the utility in measuring, or otherwise assessing, indicators of community sustainability. The goal of much of the community indicator research is to establish baselines upon which future comparisons might be made. There may be widespread disagreement among these parties on what ought to be measured, or how indicators ought to be measured. However, there is growing consensus that indicator approaches are useful, at least for an initial attempt to measure community sustainability, or to provide a snapshot of community well-being at a given point in time.

This report is intended to familiarize groups interested in taking a social indicator approach to community sustainability with some of the current efforts underway. We have also reviewed and discussed some of the past research that has shaped the way we understand and attempt to measure community sustainability. Overall, there is great diversity in indicators advocated, though some indicators emerge as consensus picks across a range of authors. These should be given special consideration by newcomers to this field.

Recent work in social indicators of community sustainability is attempting to combine the strengths of both subjective and objective approaches. Indicators from existing secondary sources are certainly useful; however, new databases also need to be created. If policy decisions are to be made from indicator work, particularly at the local level, more subjective community self-assessments need to be built into sustainability monitoring efforts.

There is certainly room for future research and development in the area of community sustainability indicators. Our understanding of causal relationships and interactions between community well-being and environmental variables need to be strengthened. In the past, spurious assumptions were made regarding even flows of timber and community sustainability. While history has proved this simplistic assumption to be wrong, we have not ventured too far down the path toward explaining how ecological variation effects community well-being, or the implications of community variables for ecological well-being.

Many assumptions are made about the connections between healthy ecosystems and healthy communities, and many monitoring efforts still deal with environmental health and community health separately. Many of the indicators most commonly cited for community sustainability monitoring, such as poverty, unemployment, and income are likely to be negatively related to environmental health over the short term. Rapid exploitation of timber resources, for example, may reduce poverty, unemployment, and increase incomes, at a cost to the environment. Time frames for monitoring become critical in the interactions between ecological and socioeconomic indicators. Overcoming these shortcomings in current approaches will likely require interdisciplinary research that involves both social scientists and ecologists.

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